STATED MEETING, NOVEMBER 23d, 1841.

VICE PRESIDENT MORTON IN THE CHAIR.

DONATIONS TO LIBRARY.

The American Phrenological Journal and Miscellany. 8vo. Vols. 1, 2, and 3. From Nathan Allen, M. D.

An Essay on the connection of Mental Philosophy with Medicine. By Nathan Allen, M. D. 8vo. Philadelphia, 1841. From the author.

Boston Journal of Natural History. Vol. 2. Nos. 3 & 4. Boston, 1839. From the Society.

WRITTEN COMMUNICATIONS.—Mr. S. S. Haldeman submitted a note on a genus of Dolphins. He proposes the name Hypodon for those dolphins which have two teeth in the lower jaw, hitherto constituting the genus Diodon; which name, however, is preoccupied for a well known genus of fishes. The name may be thought too much like Hyperodon; but this is an advantage, as the two are taken from similar characters; Hypodon meaning *teeth below;* the other, *teeth above.* Examples, H. Desmarestii—H. Sowerbyi.

VERBAL COMMUNICATIONS.—Prof. Johnson exhibited and explained his apparatus, illustrative of the laws of chemical combination and of the combining volumes of gaseous substances.

This apparatus consists of a series of cubical types, each of such magnitude as to represent by its bulk in cubic inches the atomic weight of one of the elementary bodies. Thus hydrogen is represented by a cube one inch on a side; oxygen, by a cube of two inches on a side, containing of course eight cubic inches; iron by a cube containing twenty-eight cubic inches, and so of the whole fifty-four

simple bodies. The largest cube representing Uranium is a little more than six inches on a side. Each cube bears on one of its faces the conventional chemical symbol of the body whose atomic weight it represents, usually the first letter of its name, together with the number expressing its atomic weight. Many of the types are coloured either by a coating of the material represented, or by some convenient pigment exhibiting the natural appearance of the body represented. The number of types of each body varies with the complexity of the compounds into which it is capable of entering; the greatest number being required of those bodies, which constitute organic substances, viz. carbon, hydrogen, oxygen and nitrogen.

A second part of the apparatus consists of a light frame supporting three shelves about fourteen inches apart, open both at the front and rear. This frame is four feet long and two and a half feet high. In order to represent chemical combinations and decompositions, the atom-cubes are first placed separately upon the middle shelf, to represent the case of *solution* or the liquid state. They are then brought together to indicate *mixture of solutions*. To represent *precipitation*, those atoms which are in fact precipitated in actual solutions are carried to the lower shelf; and to represent the products *converted into gas*, those atoms which constitute such products are carried from the middle to the upper shelf.

The chemist performs the processes first in his jars or retorts, and then arranges the atoms to indicate the real operations which have been taking place before the eyes of his class.

In exhibiting the combinations of bodies which may assume a gaseous form, Prof. Johnson makes use of a third apparatus, consisting of glass cubical boxes of 100 cubic inches each, and of others containing 50 and $16\frac{2}{3}$ cubic inches.

To represent the combinations and decompositions of gases as in experiments in Eudiometry, both the cubical types and glass boxes are brought into requisition. Thus the type of hydrogen (a cube one inch on a side, marked H—1,) is placed on the upper shelf, and over it is inverted a cubical glass box, marked 100, and actually containing that number of cubic inches; an oxygen type (marked

O—8) is placed separately on the same shelf under a glass box of the same size as to base, but of only half the height of the former, and containing of course 50 cubic inches. To represent the combination of these gases to form water and to indicate the amount of condensation which takes place, the oxygen type is taken from under its own box and placed with the hydrogen type beneath the glass box of 100 cubic inches, the 50 inch box being at the same time removed from the frame. There is then seen the sum of the weights of the constituents of water (9), and the bulk of the vapour of water, the same as that of the hydrogen which had entered into its composition. To convey the impression that the product is a liquid, the resulting combination of atoms is carried from the upper to the middle shelf, without being accompanied by the volume-cube.

The advantages found to result from this method of illustration over those hitherto in use were stated to be the saving of much time and labour, in writing out diagrams and making drawings, and the avoiding of inconvenience of working at a black-board to give after all but an imperfect impression of the truth to be conveyed. An effect of not less importance was derived from appealing to different faculties at the same time.

To some minds the bulk of a body conveys a far more distinct impression of its weight than the figures which represent that weight. In the method now exhibited, both these modes of appealing to the mind and memory are united. The colour of many of the substances combined with the bulk—with the symbols which represent them and with the figures which express their weight, can hardly fail to fix a lasting impression on the mind of every student in chemistry. To these may be added the facility of making apparent by direct juxtaposition the relation by weight and by volume of the constituents of all gaseous mixtures.

The application of this apparatus was shown in exhibiting the composition of the oxides and other minerals.

The views of M. Liebig in regard to the composition and true *radical* of Phosgene gas, carbonic acid and oxalic acid, were also displayed.

The constitution of ammonia, of atmospheric air, of nitrous

oxide, and binoxide of nitrogen, was illustrated both in regard to atomic weight and combining volume, as were the several compounds of chlorine with oxygen. The acetate of lead was decomposed by a solution of hydrosulphate of ammonia, and the resulting acetate of ammonia, sulphuret of lead and an atom of water were indicated as the results.

Chloride of iron precipitated by carbonate of ammonia, exhibited the effects of giving a precepitate of oxide of iron and evolving carbonic acid, decomposing water instead of forming it as in the preceding example.